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THE BRITISH MARTEN

MARTES SYLVATICA, Nilsson.

BY THE EDITOR.

(Continued from Zool. 1892, p. 138).

IN 'The Zoologist' for 1891 (pp. 401—409) I commenced to give some account of the Marten as one of our rarest indigenous mammals, and in a subsequent article (pp. 450—459) some attempt was made to trace its distribution throughout the English counties. In the volume for 1892 (pp. 131—138) some important additions were made to the records from information supplied by various correspondents, and finally I stopped short of Wales, reserving for some future occasion a transcript of my notes relating to the occurrence of this animal in the principality.

The zoology of the Welsh counties has been unaccountably neglected since the days of Pennant and Bingley, and little has been published on the subject, with the exception of a few local lists of Birds. The Mammals have hardly been noticed, beyond the occasional insertion in this journal, and in 'The Field,' of a few lines reporting the occurrence of some of the rarer animals, such as the Marten and the Polecat. And yet, considering the wildness of the country and the many suitable haunts which must surely exist in some of the wooded and less populated parts of Wales, it is probable that these creatures, if looked for by competent naturalists, would be found to be less rare than is commonly supposed. From time to time I have made notes of

Welsh localities in which the Marten has been met with, and although I do not suppose that they represent anything like a complete indication of its present haunts, an examination of these may pave the way perhaps for further particulars, should these lines meet the eyes of readers who are in a position to give fuller information on the subject.

As regards North Wales, Mr. P. L. Sclater, writing in this journal so far back as 1845, reported (p. 1018) that in the summer of the previous year, while staying at Llanberis he saw a Marten killed by a pack of hounds which were kept for the purpose of killing foxes, wild cats, and other vermin. The Welsh huntsmen who followed this pack on foot, with iron-spiked poles, assured him this animal was then common there, amongst the rocks, and was destructive to lambs. The pack of hounds referred to has long since ceased to exist. About the end of 1879 three were killed in the neighbourhood of Bethgelert, and were preserved for the landlord of 'The Goat' Inn, where they were seen two years afterwards by Mr. Cecil Smith (Zool. 1881, p. 419). Since that time others have been reported in the neighbourhood of Bethgelert, and two were trapped in February, 1890, on Lord Penrhyn's moors, by Conway Lake. Donovan, in his 'Natural History of British Quadrupeds,' has referred to the former existence of the Marten in Carnarvonshire and Merionethshire.

About 1867 a Marten was killed by the late Mr. Gwynne Vaughan's hounds near Llanwrtyd, in Brecknock. The skin is still in the possession of Mr. E. C. Phillips, of Brecon, who is aware of the existence of four stuffed specimens obtained in this county since 1857, and who reported (Zool. 1887, p. 190) that one of these animals was seen in a wood near Brecon in September, 1886. Writing to us recently on the subject, he says:—"The Marten was formerly common in Brecknockshire, but is now, I fear, almost extinct; although it is possible that a few still survive in some of the large woods and deep dingles. A lady who is well known as a naturalist, and whose father kept hounds in the extreme north of this county many years ago, tells me that they often found and killed a Marten both in Brecknockshire and Radnorshire, and she once remembers seeing two bolted from one hole; they were soon run into and easily killed. The large woods of Llangoed, Breconshire, were formerly a noted place for

them, and about fifteen years ago one was trapped at Henallt Wood, not far distant. It is still preserved in the possession of Sir Joseph Bailey. At the present time there are several stuffed specimens in and near Brecon, but the last living one was seen by my son in September, 1866, in a very large wood near Brecon. As I have the shooting of this wood, I know it has not been trapped for vermin for over twenty years. The old rough Welsh hound will hunt the Marten with great keenness, and about twenty-five years since two hounds belonging to my father-in-law that were 'at walk' at Cefn, Carmarthenshire, midway between Llandovery and Llanwrtyd, hunted a Marten by themselves and killed it. I have the skin now, although it was sadly torn; but the Marten was very scarce even then; still one would think that the large coverts of scrub oak which were formerly so dense in the upper part of Carmarthenshire would be exactly suited to its habits. Of late years these oak woods have given place to larch, but I should think it likely that there still may be some about Ystraddfin and the upper parts of the Towy, where what the keepers are pleased to call 'vermin' are not kept down, and the same remark would apply the wilder portions of the county of Radnor. From the above it will be seen that the Marten is almost, if not quite, extinct in these three counties, and before the end of the century I fear it will have to be classed with the Wild Boar and the Wolf which formerly existed here."

In the neighbouring county of Glamorgan, as we learn from Dillwyn's 'Materials for a Fauna of Swansea,' the Marten was formerly to be met with near Swansea in Clive Wood and Neath Valley, and it is recorded, in 'The Zoologist' for 1849 (p. 2440), that in April of that year one was killed in the neighbourhood of Newbridge.

(To be continued.)

BIRD MIGRATION AT HELIGOLAND.

By H. Gatke.

The February number of the 'Zoologist' (pp. 71—73) contains an article by Mr. Seebohm, in which, though it is directed against Mr. Cordeaux, I am accused of inaccuracy and ignorance respecting the birds that have passed through my hands, either alive or recently killed on Heligoland, during the last fifty-five years. In the first instance, Mr. Seebohm maintains that "very many" of the species of a list of accidental visitors furnished by me to Mr. Cordeaux are in reality "regular autumn visitors on migration to Heligoland," and, in substantiation of his assertion, Mr. Seebohm names, out of the "very many," but four instances, *viz.*, the Shore Lark, *Alauda alpestris;* Richard's Pipit, *Anthus Richardi;* the Rustic Bunting and Little Bunting, *Emberiza rustica* and *E. pusilla.* I doubt whether Mr. Seebohm has been very lucky in his choice, for if he had taken the trouble to acquaint himself with what I have very explicitly said ('Vögelwarte Helgoland,' p. 375) respecting the migratory movements of *Alauda alpestris*, he would have found that not only am I very far from considering this bird an accidental visitor to Western Europe, but, on the contrary, I endeavoured to prove that its winter-quarters must of necessity be looked for in certain localities of France and Spain.

Widely different stands the case with *Anthus Richardi*, a native of the far east of Asia, from Lake Baikal to the Sea of Ochotzk; its regular line of autumnal migration runs south, and it consequently is a common winter resident in South China and the eastern parts of India, Bengal for instance, being in Calcutta a plentiful market bird during the winter months. Such individuals, therefore, as under exceptional and undoubtedly meteorological influences adopt at irregular periods—though in rare instances in comparatively considerable numbers—a western instead of their normal southern autumnal migration flight, can reasonably be pronounced only accidental visitors to Europe,—the more so since even the cases of appearance in greater numbers of this Pipit have occurred mostly at intervals of from six to ten years, *viz.*, in 1839, '48, '49, '59, '68, '69, '70, and '76. On account of prevailing westerly winds, *Anthus Richardi* has,

during the last fifteen years, been obtained here but once or twice about every third year.

More surprising still is Mr. Seebohm's attempt to rank the Rustic Bunting among the regular autumnal visitors of Heligoland. In my collection this species is represented by eight specimens, obtained here between 1840 and 1883, one more having been caught during a temporary absence of mine, but spoiled for preservation; these nine birds include all the instances of its capture on Heligoland, for since 1883 no Rustic Bunting has been shot here. And on so scant a number of cases, scattered over more than half a century, Mr. Seebohm rests his assertion that this Bunting is a regular, and not an accidental, visitor to Heligoland. It may be added that, respecting Great Britain, only three instances of the capture of this species are on record.

The Little Bunting, like the foregoing species, breeds throughout the whole north of Asia, and its winter-quarters are likewise in China and India, its normal autumnal migration flight being south; western deviations, therefore, can also be attributed only to meteorological influences, and happen for this cause very irregularly. Altogether I have obtained this Bunting on Heligoland from twenty-five to thirty times; but this comparatively considerable number is not spread evenly over the fifty-five years of my ornithological pursuits. From 1845 to 1852 this bird was shot here once or twice every autumn; then followed a great scarcity till 1879, during the latter part of September and greater part of October of which year this Bunting—together with the Rustic Bunting—was observed frequently and shot repeatedly; since the latter date—that is to say during the last thirteen years—not a single specimen has been obtained; all these years westerly winds prevailed during the autumnal migration periods. In Great Britain this Bunting has been taken but once.

Considering the above facts, it would appear rather a rash undertaking to pronounce *Emberiza pusilla* a regular, instead of an accidental, visitor to Heligoland.

Mr. Seebohm further states that I did not, and in fact could not, know and distinguish a young bird, in its first spring dress, from adults of the same species; the absurdity of such a statement is almost too great to call for any remark.

Appearing, however, in a scientific periodical as an argument in support of his assertion that most of the great number of rare accidental visitors to Heligoland were not old birds, but birds in their first spring,—that is to say, not quite a year old,—I feel called upon, in order to show the fallacy of this latter hypothesis, to give further on a list of such specimens of the visitors in question as are beyond doubt two years old and more, and not young "blundering" individuals in their first year. There is surely far less "blundering" in the migratory movements of birds than is to be found in some of the laborious compilations about migration.

Respecting Mr. Seebohm's opinion that "of course no evidence is to be found in the (my) book" that I could distinguish a young from an old bird, I have to add that I certainly did refrain from swilling my work with descriptions of the common order to be found in scores of books, but that where I deemed it advisable—as, for instance, with *Anthus Richardi*—I have given a very complete description of all stages of plumage from two months to two years of age and upwards. In support of his view, Mr. Seebohm particularly quotes *Turdus varius*: had he proceeded, however, in a less superficial manner, he would have found in my book (pp. 243 and 244) a description of this Thrush, giving, as a peculiar character of the same, the "purely white" and deep black streak which extends over the under side of the extended wing of the bird. Mr. Seebohm laying down this mark as a particular sign of age in the species, he must, by his own evidence, allow the nine examples of *T. varius* to pass as adult birds.

Here may follow the list of such rare exceptional visitors as are represented by specimens of two years of age and more:—*Falco rufipes*, 2 males, 1 female; *Muscicapa albicollis*, 1 male; *Pastor roseus*, 9 males, 7 females; *Turdus saxatilis*, 2 males, 1 female; *Sylvia mesoleuca*, 1 male; *S. Bonelli*, 1 male; *S. viridanus*, 1 male, 1 female; *S. virens*, 1 male; *Accentor alpinus*, 3 males; *Saxicola aurita*, 2 males; *S. deserti*, 2 males; *S. morio*, 1 male, 1 female; *Anthus ludovicianus*, 1 female; *Alauda leucoptera*, 1 male, 1 female; *A. tatarica*, 1 male, 1 female; *Emberiza aureola*, 1 female; *E. cæsia*, 8 males, 1 female; *E. pityornis*, 1 male; *E. rustica*, 6 males, 1 female; *E. pyrrhuloides*, 1 male; *E. melanocephala*, 6 males, 4 females; *Hirundo rufula*, 1 male; *Cypselus melba*, 1 male; *Charadrius fulvus*, 2 males; *C. caspius*,

1 male; *Anas perspicilata*, 1 male; *Larus affinis*, 1 male; *L. Rossi*, 1 male. To these may be added, *Sylvia superciliosa*, 11; *Anthus Richardi*, 20 at least; *Alauda brachydactyla*, the same number; and *Emberiza pusilla*, 10. Together 140 birds, every-one of which I had fresh in my hands, and ascertained their sex by dissection.

Young birds of the age of one year or less, of the south-eastern species enumerated in the foregoing list, have been obtained here in very rare instances; they are:—*Falco rufipes*, once; *Pastor roseus*, 6 young grey birds; *Turdus saxatilis*, 1 in first autumn; *Sylvia viridanus*, 1 in first summer; *Saxicola deserti*, 1 in first autumn; *Emberiza melanocephala*, 1 in first summer, 1 in second summer; *Charadrius caspius*, 1 in first autumn; *Alauda brachydactyla*, 1 in first autumn.

With the exception of a few American birds, the accidental visitors are divided, according to season, strictly into two groups, *viz.*, those which come from the far east and east-north-east, and those whose home lies in a south-eastern direction—Greece, Asia Minor, Palestine, Turkestan. The former appear almost without exception in autumn, the latter quite as exceptionally from the end of May to the end of July; the former, like all autumnal migrants, consisting of about two-thirds of young birds, from two to three months old, whilst the latter are represented almost exclusively by old birds, and principally by the finest old males. Both movements are favoured by light south-east winds and fine warm weather. What, however, causes a small number of individuals of these eastern species to give way to meteorological influences, and adopt a western flight instead of their normal southern autumnal migration, would be very difficult to say. It would seem easier to solve the question respecting those visitors from the south-east which appear during the breeding-time, and nearly all of them being fine adult birds; the approximate conclusion is, that they are individuals which have lost their mate at a more or less early period of their nesting, and, the impulse of propagation being not yet extinct, they resume their inherent line of spring migration, being in their case towards the north-west, and so pass on to Germany and England. This view of the case is supported by the fact that the greater number of these birds are very fine old males; the females on the nest being more subject to destruction by their manifold enemies. Further support of this

view is afforded by the appearance in Great Britain of numerous birds of Western Africa and Spain; for instance, *Accentor alpinus*, *Merops apiaster*, *Cypselus melba*, *Cursorius europæus*, and others, most of which have been obtained from twenty to thirty times, and thus under the same circumstances must have resumed their spring migration, which in their case, however, lies in a northern direction.

The foregoing statements will, I trust, prove that the much-debated exceptional visitors of Central and Western Europe consist not of individuals which ramble at random about the world, but that, since their appearance from homes so widely separated takes place at as widely separated fixed seasons, and to a great extent depends on the age of the wanderers, these exceptional movements of each of these two groups must of necessity also be governed by fixed recurring causes. Ornithologists ought to give up the worn-out myth of inexperienced young birds dependent on the teaching and guidance of their experienced parents; for the moment the young are tolerably well able to take care of themselves, parents and young separate, and become perfect strangers to each other. The first perfect plumage of the latter being completed in a few weeks, they start of their own accord, and entirely by themselves, on their first migratory excursion, whilst many of the parent birds devote themselves to a second brood, or, at all events, have to go through the tedious process of change by moult of their entire plumage, being thus detained for one to two months from following their offspring into winter-quarters. This holds good for nearly all regular passengers in Heligoland, the sole exception being the Cuckoo, which, leaving the care of hatching its egg and rearing its young to kind-hearted foster-parents, is free to go south whenever it pleases. The most striking instance of young birds preceding their parents in autumn by a month or two is furnished by Starlings, *Sturnus vulgaris*; young grey birds appearing here by hundreds and thousands at the latter part of June, without in any case being accompanied by a single old one, the autumnal movement of the latter commencing about the end of September, lasting through October, and occasionally till late in November. Quite as regularly, but in a reversed succession, does the return movement in spring take place, when the finest old males are invariably the first to appear; for instance, orange-billed, glossy

black, Blackbirds, *Turdus merula*, shortly followed by old females, and later by young of the previous spring, the rear being brought up by the halt and lame,—birds of all ages, in defective plumage, having lost part of their tail or some of the primary wing-feathers, some toes, or even a whole foot. This order by age and sex is maintained with unfailing precision by all species during their respective periods of autumn and spring migration. Heligoland being in fact an unequalled "Vögelwarte"—bird observatory—the seasonal movements of birds pass before the observer in their original purity; no birds, either old or young, reside here to raise any doubt as to whether the individuals seen by observers are natives of the place or passengers.

Finally, I may remark that the 'Vögelwarte Helgoland' is not, as would appear from Mr. Seebohm's repeated allusions to the same in the 'Zoologist' and the 'Ibis,' a mere enumeration of the birds observed and obtained on the island, the section of the book relating to these birds being of merely secondary import; the principal part of the work consisting of observations on migration, which are divided into nine chapters, *viz.*:—Migration in general; Direction; Height and speed of migratory flight; Succession as to age and sex; Meteorological influences on migration; Exceptional occurrences; What induces birds to start on migration; and What guides them during the same.

ON A NEWLY-OBSERVED HABIT IN THE BLACKCAP WARBLER.

By John Lowe, M.D., F.L.S.

A singular habit of the Blackcap, *Sylvia atricapilla*, which I have noticed during the present spring may be worth recording, if, as I suppose, no previous note has been published on the subject.

In the garden of the Martinnez Hotel, Orotava, Teneriffe, are some large bushes of *Hibiscus Africanus*, which are covered with their brilliant scarlet blossoms. Being only ten or twelve feet distant from the balcony, one can see everything that passes in them with great facility. They are the favourite resort of the Blackcap Warblers, which come there to feed, taking but little

notice of anyone who may be on the balcony. My attention was first drawn to them by observing the male bird fly, every now and then, to one of the flowers, creep along its stem, and peck at the calyx. Examining the flower to see the meaning of this proceeding, I found that, in almost every instance, the two upper segments had a small piece bitten out of them, while in some cases the calyx segment was torn right across.

On examining a large series of flowers, by removing the calyx it appeared that under each of the two upper segments there is a single drop of slightly sweet and sticky watery fluid — how secreted I could not determine, as there is no semblance of a nectary. The fluid is found under none of the other segments, nor is it present in flowers which grow low down and in the shade, and only rarely on the pink blossoms of a variety which grows near. The calyx of these flowers is not bitten; but an occasional scarlet flower, which occurs on the pink variety, has always holes in the calyx.

The object of making the holes is, as it would seem, not to get at the liquid for the purpose of drinking it, but in order to attract insects to serve as prey. Several times I have observed the bird seize an insect in the act of visiting the pierced calyx, which after being bitten shows a moist spot. When this dries up I have observed the bird tear the calyx segment across, when a little fresh moisture exudes; but this is never done until the two small holes have dried up. After prolonged watching I could not find that more than two kinds of insects visited the calyx, and these — one a small bee and the other a small wasp — flew directly to the calyx without visiting the flower. No flies of any kind came, and no other insect except an ant, which evidently came to visit a few Aphides which lived on the calyx.

I could not discover that any insect visited the flower except a large humble bee, and this always went straight to the flower itself, and never attempted the calyx. It was able, apparently, to reach the fluid betwixt the petals which have an opening at their base, through which the proboscis can readily be passed into the calyx.

All the points which I have described were observed repeatedly, not only with the naked eye, but also with a binocular glass, and I do not think it possible that I can be mistaken in any one of them.

The salient features in the observation are, I think, remarkable:—(1.) The fact of the bird choosing the only spot where the liquid occurs, in order to make the opening in the calyx which is to serve as the bait for the insect. (2.) The visit of the insects paid directly to the calyx, and not to the flower. (3.) The fact that the humble bee, which so commonly makes this kind of aperture in the fuchsia and other flowers, should in this instance make no approach to the calyx. (4.) That the punctures are, so far as I have observed, made only by the male bird, never by the rufous-headed female.

The honey bee, which visits in large numbers a tree close by, never approaches the *Hibiscus*.

March 18.—I found, on further investigation, that the flowers of the pink variety of *Hibiscus Africanus* do not secrete any nectar, and are but little visited by the humble bee. The cause appears to be that the corolla overlaps at the base much more closely than in the scarlet flowers, so that no opening is left for the proboscis; in the scarlet there is an opening. Can it be that the nectar under the calyx is due to the irritation caused by the vent of the humble bee? I think it clearly is so. The scarlet flowers which occur on the trees with the pink variety always have nectar, and the calyx torn—the pink flowers never.

Monte, Las Palmas, Grand Canary, March 22.—I find that *Hibiscus Africanus* has been treated here in the same way by the "Capirote" (*Sylvia atricapilla*). But I also find that *Abutilon frondosus*, another plant of the *Hibiscus* family, has undergone a similar mutilation of the calyx. In this instance, however, there are notable differences. The base of the calyx has nectar all round the receptacle, and not, as in *Hibiscus*, on two spots midway on the inner surface of the two upper segments,—hence the openings are made in each segment,—and they are made not by the Blackcap Warbler, but by a black-headed Tit with bluish-green body. The object seems to be — but I cannot be quite sure of this—to enable it to get at the ants, which come to the nectar in large numbers. In the case of the *Hibiscus* they do not enter the calyx, and only a few visit the flowers apparently to milk the Aphides, and these are not found on the *Abutilon*. There are not many winged insects visiting these flowers, except a large species of wasp.

The Titmice visit the flowers in succession, tearing out large

bits of the calyx and letting them fall, searching busily inside, and apparently eating the ants; possibly also making a fresh bait in the juice which exudes. It is quite curious to see them so busily employed on these pendulous flowers, which are also visited by humble bees, but in a manner different from that which takes place in the *Hibiscus*, where they enter the flower by crawling along the lower petals, and can only probe the spaces betwixt the upper ones. In *Abutilon* they climb up the stamens, and—the spaces at the base of the petals being much wider than in *Hibiscus*—they are able to reach the nectary through them all.

These facts are, I think, interesting, but they do not seem quite so remarkable as those which relate to the Blackcap. I shall be glad to learn whether they have any novelty.

PROPOSED AMENDMENT OF THE WILD BIRDS PROTECTION ACT, 1880.

A BILL to amend the Wild Birds Protection Act, 1880, has been prepared and brought in by Sir Herbert Maxwell, Sir John Lubbock, Mr. Baird, Mr. J. A. Pease, Mr. Loder, and Mr. Bagot; and on the 13th April was ordered by the House of Commons to be printed. Its provisions are as follow:—

WHEREAS it is expedient to provide for the better protection of certain species of wild birds in the United Kingdom:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

I. This Act may for all purposes be cited as the Wild Birds Protection Act, 1893, and shall be construed as one with the Wild Birds Protection Act, 1880 (hereinafter referred to as "the principal Act"), except as hereinafter provided.

II.—(1.) Any county council as to any county in Great Britain and the justices in quarter sessions as to any county in Ireland (which bodies are hereinafter respectively referred to as "the authority"), may, after the *passing of this Act*, prohibit the taking or destroying the eggs of any species of wild bird in any place or places within the county, and any person who shall take or

destroy, or incite any other person to take or destroy, the eggs of any species included in such order in any place specified therein, shall, on conviction before any two justices of the peace in England, Wales, or Ireland, or before the sheriff in Scotland, forfeit and pay for every egg so taken or destroyed a sum not exceeding *one pound.*

(2.) Any order made under this section shall be published by the authority not less than *fourteen days* before the commencement of the period when the prohibition shall commence, by advertisement in the principal newspaper or newspapers published within the county, or, if none are published therein, then in the principal newspaper circulating within the county, and by such further means as the authority may determine.

(3.) A copy of any such order purporting to be certified by the clerk of the authority shall be evidence of the order having been made.

(4.) All expenses incurred by the authority in the making or publishing of the order shall be defrayed out of any fund or rate out of which the general expenses of such authority are payable by law.

III. The Wild Birds Protection Act, 1881, is hereby repealed.

IV. The schedule to the principal Act shall be read and construed as if the word "lark" had been inserted therein.

The proposal to empower county councils to prohibit the taking of eggs is one on which some difference of opinion may be expected to arise. There is a good deal of sentiment about the time-honoured practice of "birds-nesting," a practice in which boys in all ages have been permitted, and indeed encouraged, to indulge, provided they do not trespass nor commit wilful damage,—restrictions, however, which are too often but lightly regarded. To abolish this ancient practice entirely would be not only unwise, but unnecessary. There are many birds whose eggs may be taken without prejudice to anyone, and without fear of exterminating the species to which they belong, so long as the parent birds are not killed or taken at the same time. But there are others, like the Lapwing or Peewit and Black-headed Gull, whose eggs are a source of profit to those upon whose lands they are found breeding, and which are taken wholesale by un-

authorised persons who entirely ignore the rights of *meum* and *tuum*, and disregard the law of trespass. The eggs, also, of Woodcock, Snipe, and wild ducks of various kinds, are valued for the sake of the broods they may produce, to the advantage of wild-fowl shooters, and to the augmentation of good and marketable food.

It is not unreasonable that some check should be imposed upon the indiscriminate collection of such eggs as these; and provided that those who may have to apply to the County Council for an order, should the Bill pass, will exercise discretion and moderation in their demands, the result to all concerned should be distinctly beneficial.

A CATALOGUE OF LOCAL LISTS OF BRITISH MAMMALS, REPTILES, & FISHES, ARRANGED UNDER COUNTIES.

By Miller Christy, F.L.S.

In July, 1890, I contributed to the 'Zoologist' (3rd series, vol. xiv, pp. 247—267) "A Catalogue of Local Lists of British Birds," which (to judge from the amount of correspondence I have received upon the subject) appears to have been deemed of interest and value by other ornithologists. I have, therefore, been led to compile similar catalogues relating to Mammals, Reptiles, and Fishes, although the compilation of such catalogues involves an amount of personal trouble and research of which those who have not undertaken such work can have no conception. The present catalogues complete the Vertebrate Fauna of Britain. For convenience, the Reptiles and Amphibians have been thrown into one list.

The system on which I have worked is the same as that adopted in the bird-catalogue, but requires a few words of explanation. The titles of the works catalogued are given chronologically under counties, the latter being arranged under England and Wales, Scotland, and Ireland. The details are entered in the following order:—Surname of author, Christian name, as much of the title as is necessary for identification, the name of the periodical or volume in which the article or list in question appeared (if not separately published), place of publi-

cation, size, and date, followed in many cases by a few brief remarks on the work catalogued. The date of publication has, contrary to custom, been placed after the size, for convenience of reference. In the case of magazine articles, or of lists which form portions only of larger works, the title of the magazine or work of which they form part, has been given *in italics*, for the sake of distinction.

With scarcely an exception, I have excluded all volumes or articles which do not aim at giving a *tolerably complete list* of the species inhabiting the districts of which they treat. Mere notes or observations on a few species only are, therefore, entirely omitted, even although they may be purely local. For instance, the Rev. H. A. Macpherson's interesting pamphlet on 'The Visitation of Pallas's Sand Grouse to Scotland in 1888' (London, 8vo, 1889) and many similar essays are excluded. To have included notices or articles on the distribution of single species over certain areas, or their occurrence in certain spots, would have enormously swelled (and totally changed the constitution of) my catalogues. This would, in fact, have made them nothing less than a complete index to the literature of the British vertebrate animals—a work for which my leisure is altogether inadequate.

In every case, the titles of the volumes or articles entered in my bibliography have been taken by me direct from the works themselves, and have not been obtained second-hand, except in those few instances in which I clearly state that I myself have "not seen" the works in question.

I have been taken to task by more than one good naturalist for having arranged the items in my catalogues according to political, rather than natural, divisions. I maintain, however, that the course I have adopted is the right one. I regard these catalogues merely as a means towards an end—namely, the ultimate mapping-out of the exact distribution of each British species. This should, of course, be done with regard to the *natural* divisions; but so much of the work which goes to make such a mapping-out possible, has been done with regard only to *political* boundaries (such as those of counties) that there was little or no alternative but to compile the present catalogues in the form I have adopted.

Surprise will, I think, be felt at the extraordinarily-large number of "Local Lists" which it has been found possible to in-

clude within the somewhat narrow lines of the present catalogues. The number certainly shows in a very effective manner the great activity of British naturalists, and indicates that, when the actual mapping-out of the exact geographical distribution of each species comes to be undertaken, it will be possible to accomplish it with a very near approach indeed to precision.

The catalogues will, of course, indicate at a glance those counties whose fauna has received most attention; but it may be as well to point out those which have received least, and which, therefore chiefly require that some local observer should undertake the work of setting forth the main peculiarities of their fauna. This will accordingly be done in some remarks which will appear at the end of each list.

I shall be particularly obliged to those readers of the 'Zoologist' who, observing omissions in my catalogues, will be good enough to call my attention to them, as it is intended shortly to re-publish the present catalogues in separate form, with additions, as was done in the case of the previous Catalogue of Local Lists of Birds. There are, doubtless, many more local lists, not herein catalogued, to be found in old county histories, the Proceedings and Transactions of local Natural History Societies, and in local topographies and guide-books. It is impossible to become acquainted with many of these, except through the kindness of correspondents.

MAMMALS.

ENGLAND AND WALES.

BEDFORDSHIRE.

Davis, Frederick.—[Mammals of the Neighbourhood of Luton.] In his *History of Luton*, pp. 192-93. Luton, dy. 8vo, 1855. (Enumerates 25 species, without comment.)

Miller, S. H., and S. B. J. Skertchly.—[The Mammals of the Fenland]. In their *Fenland, Past and Present*, pp. 358-362. Wisbeach and London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

CAMBRIDGESHIRE.

Miller, S. H., and S. B. J. Skertchly.—[The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362, Wisbeach and London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

CHESHIRE.

Leigh, Chas.—[The Mammals of Cheshire.] In his *Natural History of Lancashire, Cheshire, and the Peak in Derbyshire*, book ii, pp. 1-7. Oxford, fcap. fo., 1700. (Only a few species are mentioned, and those chiefly domestic.)

CORNWALL.

Borlase, Rev. Wm., F.R.S.—[The Mammals of Cornwall.] In his *Natural History of Cornwall*, pp. 286-291. Oxford, fcap. fo., 1758. (The species enumerated are chiefly domestic.)

[Anon.] [The Mammals of Cornwall.] *Monthly Magazine*, vol. xxvi, pp. 443 & 528. London, dy. 8vo, 1808. (Enumerates 25 wild species.)

Polwhele, Rev. R.—[The Mammals of Cornwall.] In his *History of Cornwall*, vol. iv, p. 126-127. London, dy. 4to, 1816. (Very imperfect.)

Couch, Jonathan.—[The Mammals of Cornwall.] In his *Cornish Fauna; being a Compendium of the Natural History of the County*, pp. 6-10. Truro, dy. 8vo, 1838. (A good list; includes domestic species; for 2nd ed., see under J. Brooking Rowe, Truro, dy. 8vo, 1877.)

Cocks, W. P.—[The Mammals of the Falmouth District.] *Naturalist* (Morris's), vol. i, pp. 37-39. London, roy. 8vo, 1851. (Enumerates 29 wild terrestrial species.)

Bullmore, W. R., M.D.—[The Mammals of Cornwall.] In his *Cornish Fauna: a Short Account of all the Animals found in the County, &c.*, pp. 1-7. Truro, dy. 8vo, 1867. (A good list; enumerates 41 wild species.)

Bate, C. Spence, and others.—[The Marine Mammals of the South Coast of Devon and Cornwall.] In *Brit. Assoc. Report for 1869*, pp. 84-85. London, dy. 8vo, 1870.

Rowe, J. Brooking.—[The Mammals of Cornwall.] *The Journal of the Royal Institution of Cornwall*, no. xix, pp. 396-403. Truro, dy. 8vo, 1877. (Jonathan Couch's Cornish Fauna [*q. v.*], revised and corrected by J. Brooking Rowe; an excellent list; enumerates 44 species; also reprinted separately.)

CUMBERLAND.

Heysham, Dr. John.—[Mammals of Cumberland.] In Wm. Hutchinson's *History of the County of Cumberland*, vol. i, pp. 1-4. Carlisle and London, 2 vols., dy. 4to, 1794. (An admirable list for the period; enumerates 29 wild species.)

Macpherson, Rev. H. A.—[The Mammals of Cumberland.] In his *Vertebrate Fauna of Lakeland*, pp. 1-86. Edinburgh, dy. 8vo, 1892. (An admirable list; enumerates 42 living species.)

DERBYSHIRE.

Leigh, Chas.—[The Mammals of Derbyshire.] In his *Natural*

History of Lancashire, Cheshire, and the Peak in Derbyshire, book ii, pp. 1-7. Oxford, fcap. fo., 1700. (Only a few species are mentioned, and those chiefly domestic.)

GLOVER, STEPHEN.—[The Mammals of Derbyshire.]; a Sketch of the Zoology of Derbyshire. In this Author's *History and Gazetteer of the County of Derby, &c.*, vol. i, pp. 112-121. Derby, 2 vols., dy. 4to, 1831. (A fair list; enumerates 34 species, of which 7 are domesticated and several extinct.)

DEVONSHIRE.

POLWHELE, Rev. R.—[The Mammals of Devonshire.] In his *History of Devonshire*, vol. i, pp. 114, and 125-135. Exeter and London, dy. fol., 1797. (An excellent list for the period; includes domestic animals.)

[Anon.]—[The Mammals of Devonshire.] *Monthly Magazine*, vol. xxvi, pp. 433 & 528. London, dy. 8vo, 1808. (Enumerates 25 wild species.)

TURTON, W., and J. F. KINGSTON.—[The Mammals of the Teignmouth District.] In their *Natural History of the District [around Teignmouth]*, 5 pp. Teignmouth, fcap., n. d. [1830].

BELLAMY, J. C.—Catalogue of the Mammals . . . inhabiting South Devon and the adjacent Sea. In his *Natural History of South Devon*, pp. 192-197. Plymouth & London, post 8vo, 1839. A very extensive list enumerating 43 species, including several which are doubtful.)

ROWE, J. BROOKING.—The Mammals of Devon. In his *Catalogue of the Mammals, Birds, Reptiles, and Amphibians of Devon*, pp. 2-11. London and Plymouth, dy. 8vo, 1863. (An excellent list; enumerates 41 species)

BATE, C. SPENCE, and others.—[The Marine Mammals of the South Coast of Devon and Cornwall.] In *Brit. Association Report for* 1869, pp. 84-85. London, dy. 8vo, 1870.

JORDAN, W. R. HALL.—[The Mammals of Teignmouth and Vicinity.] *Transactions of the Devonshire Association*, vol. vi, pp. 708-709. Plymouth, dy. 8vo, 1874. (A partial list only.)

D'URBAN, W. S. M.—[The Mammals of South Devon.] In *The Handbook of Exeter*, pp. xxv-xxvii. Exeter, fcap. 12mo, n. d. [? 1875]. (A good list, though brief; enumerates about 40 species.)

CHANTER, J. R.—[The Mammals of Lundy Island.] In his *Lundy Island: a Monograph*, pp. 131-132. London, 8vo, 1877. Reprinted from *Trans. Devonsh. Assoc. Sci., Lit. and Art.*, 1871).

PARFITT, E.—[The Mammals of Devonshire.] *Transactions of the Devonshire Association*, vol. ix, pp. 306-330. Plymouth, dy. 8vo, 1877. (An excellent list; enumerates 45 species.)

DORSETSHIRE.

DALE, J. C.—Catalogue of the Mammalia . . . found in Dorsetshire. *The Naturalist* (Neville Wood's), vol. ii, pp. 171-172. London, roy. 8vo, 1837. (Enumerates 26 species.)

DANIEL, J. E.—[The Mammals of Wool, near Wareham.] *Naturalist* (Morris's), vol. v, pp. 175-178. London, roy. 8vo, 1855. (Not important.)

DALE, C. W.—The Mammals of Glanville's Wootton.] In his *History of Glanville's Wootton*, pp. 27-29. London, cr. 8vo, 1878. (Enumerates 27 species.)

DURHAM.

MENNELL, HY. T., & V. R. PERKINS.—A Catalogue of the Mammalia of Northumberland and Durham. *Trans. Tyneside Nat. Field Club*, vol. vi, pp. 111-176. Newcastle-on-Tyne, dy. 8vo, 1864. (An admirable list; enumerates 50 wild species.)

LEBOUR, Prof. J. A.—[The Mammals of Durham.] In his *Outlines of the Geology of Northumberland and Durham*, pp. 157-158. Newcastle-on-Tyne, cr. 8vo, 1886. (A brief notice; not a list.)

LOFTHOUSE, R.—[The Mammals of the Tees Valley.] *Naturalist*, vol. xii, pp. 4-9. London, dy. 8vo, 1887.

ESSEX.

LAVER, HENRY.—The Mammalia of Essex. In *Trans. Essex Field Club*, vol. ii, pp. 157-180. Buckhurst Hill, dy. 8vo, 1882. (An excellent list; enumerates 40 species.)

HARTING, J. E.—[The Mammals of Epping Forest.] In E. N. Buxton's *Epping Forest*, pp. 71-82. London, med. 8vo, 1884. (Enumerates 18 species; also with additions in the 2nd ed., pp. 68-79, London, fcap. 8vo, 1885; and in the 3rd ed., 1890.)

[HARTING, J. E.]—[The Mammals of Epping Forest.] In Percy Lindley's *Walks in Epping Forest*, pp. 129-132. London, oblong cr. 8vo, n. d. [1887].

LAVER, Dr. HY.—The Mammals of Essex. To form part of his *Vertebrate Fauna of Essex*. (In the press.)

GLAMORGANSHIRE.

DILLWYN, L. W.—Notes relating to the Mammalia found in this neighbourhood [Swansea]. In his *Materials for a Fauna and Flora of Swansea and Neighbourhood*, pp. 1-2. Swansea, roy. 8vo, 1848. (Enumerates 12 wild species.)

PROGER, T. W.—List of Mammalia . . . occurring in the neighbourhood of Cardiff. *Handbook for Cardiff and District, prepared for the use of the British Association*, pp. 150-152. Cardiff, 8vo, 1891.

GLOUCESTERSHIRE.

[Knap, J. L.]—The Journal of a Naturalist. London, cr. 8vo, 1829. (Contains observations on the Mammals; chiefly on pp. 132-150).

Nicholls, H. G.—[The Mammals of the Forest of Dean.] In his *Forest of Dean*, pp. 199-204. London, cr. 8vo, 1858. (Alludes to few species, except the deer.)

Witchell, Chas. A.—[The Mammals of Gloucestershire.] In Witchell and Strugnell's *Fauna and Flora of Gloucestershire*, pp. 1-42. Stroud, roy. 8vo, 1892. (An excellent list; enumerates 37 species.).

HAMPSHIRE. (*See also* Wight, Isle of.)

Bell, Thomas.—[Mammals of Selborne.] In his edition of White's *Natural History and Antiquities of Selborne*, vol. ii, pp. 262-263. London, roy. 8vo, 1877. (Enumerates 28 species.)

Haviland, W. A.—[The Mammals of the Winchester District.] *The Fifth Report of the Winchester College Natural History Society*, p. 115. Winchester, dy. 8vo, 1881. (Enumerates 19 species.)

HEREFORDSHIRE.

Lingwood, R. M.—[Mammals of a part of Herefordshire.] *Annals of Nat. Hist.*, vol. v, pp. 184-185. London, dy. 8vo, 1840. (Enumerates 24 species.)

HUNTINGDONSHIRE.

Miller, S. H., & S. B. J. Skertchly.—[The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach and London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

KENT.

Boys, Wm.—[The Mammals of Sandwich and its Neighbourhood.] In his *Collections for an History of Sandwich*, pp. 847-849. Canterbury, dy. 4to, 1792. (A fairly good list, though it lacks comments and includes the domestic animals.)

LANCASHIRE.

Leigh, Chas.—[The Mammals of Lancashire.] In his *Natural History of Lancashire, Cheshire, and the Peak in Derbyshire*, book ii, pp. 1-7. Oxford, fcap. fo., 1700. (Only a few species are mentioned, and those chiefly domestic.)

Byerley, Isaac.—[The Mammals of Liverpool.] In his *Fauna of Liverpool*, pp. 5-9. London and Liverpool, dy. 8vo, 1856. (Enumerates 42 species, including those domesticated.)

McNicholl, D. H.—The Mammalia of Southport. In his *Handbook for Southport*, 2nd ed., pp. 76-78. London, cr. 8vo, 1861. (A good list; enumerates 22 species; 1st ed. not seen.)

[Anon.]—List of Mammalia found round Bury.] *Report of the Bury Nat. Hist. Soc.*, 1868-71, p. 51. Bury, cr. 8vo, 1872.

Macpherson, Rev. H. A.—[The Mammals of Lancashire north of the Sands.] In his *Vertebrate Fauna of Lakeland*, pp. 1-86. Edinburgh, dy. 8vo, 1892. (A most admirable list.)

LEICESTERSHIRE.

Mott, F. T.—The Mammals of Leicestershire. *Midland Naturalist*, vol. vii, pp. 301-303. London & Birmingham, dy. 8vo, 1884. (Enumerates 25 species.)

Browne, Montagu.—[The Mammals of Leicestershire.] *Zoologist*, 3rd series, vol. ix, pp. 161-169, 214-220, & 248-253. London, dy. 8vo, 1885. (A good list; includes fossil species.)

———[The Mammals of Leicestershire.] In his *Vertebrate Animals of Leicestershire and Rutland*, pp. 1-38. Birmingham and Leicester, cr. 4to, 1889. (A considerable list, but it includes fossil and domestic species.)

LINCOLNSHIRE.

Miller, S. J., & S. B. J. Skertchly.—[The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach & London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

MAN, ISLE OF.

Kermode, P. M. C.—Some Remarks on the Mammals of the Isle of Mann. In *The Manx Note Book*, vol. i, pp. 119-129. Douglas, dy. 8vo, 1885.

———Mammals [of the Isle of Man.] *Zoologist*, 3rd series, vol. xvii, pp. 61-64. London, dy. 8vo, 1893. (A good list; enumerates 13 species.)

NORFOLK.

Browne, Sir Thos.—[The Mammals of Norfolk.] *Monthly Magazine*, vol. xx, p. 127. London, dy. 8vo, 1805. (A very imperfect list, written about the year 1670; enumerates 6 species only.)

Paget, C. J. & J.—[The Mammals of the Yarmouth District.] In their *Sketch of the Natural History of Yarmouth and its Neighbourhood*, pp. 1-2. London, dy. 8vo, 1834. (Enumerates 30 species.)

Lubbock, Rev. Richard.—[The Mammals of Norfolk.] In his *Observations on the Fauna of Norfolk, and more particularly on the District of the Broads*, pp. 1-11. Norwich & London, dy. 8vo, 1845. (A valuable list; also in the 2nd ed. edited by Messrs. Southwell, Stevenson, & Newton, pp. 1-18, Norwich & London, dy. 8vo, 1879.)

Lowne, B. T.—[The Mammals of the Yarmouth District.] In his *Popular Natural History of Great Yarmouth and its Neigh-*

bourhood, pp. 39-42 & 61-62. Yarmouth, London, & Norwich, cr. 8vo, 1863. (Enumerates 26 species; practically a second edition of the Pagets' work.)

GURNEY, J. H.—Stray Notes on Norfolk and Suffolk Mammalia. *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 22-26. Norwich, dy. 8vo, 1870. (An admittedly incomplete list; enumerates 19 species only.)

HUNT, A. LEIGH. — [The Mammals of Thetford.] In his *Capital of the Ancient Kingdom of East Anglia*, pp. 236-238. London, dy. 8vo, 1870. (An unimportant list; see *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 83-87.)

SOUTHWELL, THOS. — [The Mammals of Norfolk.] *Trans. Norf. & Norw. Nat. Soc.*, vol. i, part 2, pp. 71-81. Norwich, dy. 8vo, 1874. (A good list; enumerates 37 species; extensive additions vol. iii, pp. 657-676B, 1884, brings up the total to 41 species)

MILLER, S. H., & S. B. J. SKERTCHLY.—[The Mammals of the Fenland.] In their *Fenland, Past and Present*, pp. 358-362. Wisbeach & London, roy. 8vo, 1878. (An admirable list; enumerates 37 species.)

NORGATE, F. — Notes on Norfolk Mammalia. *Trans. Norf. & Norw. Nat. Soc.*, vol. ii., pp. 458-470. Norwich, dy. 8vo, 1878. (Though not a list, this paper contains interesting observations on no less than 25 species.)

JOHNSON (RANDALL). — An Approximate List of the Extinct Mammalia of Norfolk. *Trans. Norf. & Norw. Nat. Soc.*, vol. ii, pp. 279-292. Norwich, 8vo, 1879.

NORGATE, F.— Mammalia [of Norfolk.] In R. H. Mason's *History of Norfolk*, App. pp. xii-xiii. London, roy. 4to, 1884. (A good list; enumerates 37 species.)

SOUTHWELL, THOS.—Mammalia of Norfolk. *Trans. Norf. & Norw. Nat. Soc.*, vol. iii, pp. 657-676B. Norwich, 8vo, 1884. (Enumerates 41 species; an amplification of the author's previous list.)

NORTHAMPTONSHIRE.

MORTON, Rev. JOHN.—[The Mammals of Northamptonshire.] In his *Natural History of Northamptonshire*, pp. 442-455. London, fcap. fo., 1712. (Relates chiefly to domestic species.)

NORTHUMBERLAND.

WALLIS, JOHN.—[The Mammals of Northumberland.] In his *Natural History and Antiquities of Northumberland*, vol. i, pp. 405-414. London, 2 vols., dy. 4to, 1769. (A very good list for the period.)

[MACKENZIE, E.]—[The Mammals of Northumberland.] In his *View of the County of Northumberland*, vol. i, pp. 138-147

& 160. Newcastle-on-Tyne, 2 vols., dy. 8vo, 1811. (Relates mainly to domestic animals; also reprinted almost verbatim in the 2nd ed., vol. i, pp. 108-114, Newcastle-on-Tyne, 2 vols., dy. 4to, 1825.)

SELBY, P. J.—[The Mammals of Twizel.] In *Mag. of Zool. & Bot.*, vol. i, pp. 421-424. Edinb., Lond. & Dublin, dy. 8vo, 1837. (Enumerates 19 species.)

MENNELL, HY. T., & V. R. PERKINS.—A Catalogue of the Mammalia of Northumberland and Durham. *Trans. Tyneside Nat. Field Club*, vol. vi, pp. 111-176. Newcastle-on-Tyne, dy. 8vo, 1864. (An admirable list; enumerates 50 wild species.)

EMBLETON, ROBERT C.—[The Mammals of the Alnwick District.] In Geo. Tate's *History of . . . Alnwick*, vol. ii, p. 440. Alnwick, dy. 8vo, 1868-69. (A list merely, without comments; enumerates 30 species.)

LEBOUR, Prof. G. A.—[The Mammals of Northumberland.] In his *Outlines of the Geology of Northumberland and Durham*, pp. 157-158. Newcastle-on-Tyne, cr. 8vo, 1886. (A brief notice; not a list.)

OXFORDSHIRE.

PLOT, R.—[The Mammals of Oxfordshire.] In his *Natural History of Oxfordshire*, pp. 187-191. London, fcap. fo., 1677. (A meagre list, relating almost exclusively to domestic animals; reprinted almost verbatim in the 2nd ed., pp. 191-195. London, fcap. fo., 1705.)

BEESLEY, ALFRED.—[The Mammals of the Banbury District.] In his *History of Banbury*, pp. 600-601. London, dy. 8vo, n. d. [1841.] (A fair list, but almost without remarks; enumerates 26 species.)

RUTLAND.

BROWNE, MONTAGU.—[The Mammals of Leicestershire and Rutland.] In his *Vertebrate Animals of Leicestershire and Rutland*, pp. 1-38. Birmingham & Leicester, cr. 4to, 1889. (A considerable list, but includes fossil and domestic species.)

SHROPSHIRE.

EYTON, T. C.—[The Mammals] of Shropshire and North Wales. In *Mag. of Zool. & Bot.*, vol. ii, pp. 537-542. Edinb., Lond., & Dublin, dy. 8vo, 1838. (A very good list; enumerates 26 species; additions, vol. iv, p. 396.)

SOMERSETSHIRE.

BAKER, W.—Mammalia [of Somersetshire.] *Proceedings of the Somersetshire Archæological and Natural History Society for 1849-50*, pt. 2, pp. 140-141. Taunton & London, dy. 8vo, 1851. (Enumerates 43 species, but without comments.)

FARBROTHER, JOHN E.—[The Mammals of Shepton Mallet.]

In his *Shepton Mallet*, pp. 171-174. Shepton Mallet & London, cr. 8vo, 1859. (Enumerates 20 species.)

COMPTON, THEODORE.—[The Mammals of the Winscombe District.] In his *Winscombe Sketches*, 2nd ed., pp. 91-97. London, cr. 8vo, n. d. [? 1882.] (Also in his *Mendip Valley*, pp. 113-125, an enlarged edition of the same work, London & Swindon, dy. 8vo, 1892.)

STAFFORDSHIRE.

PLOT, ROBERT.—[The Mammals of Staffordshire.] In his *Natural History of Staffordshire*, pp. 252-267. Oxford, fcap. fo., 1686.

PITT, WM.—[Mammals of Staffordshire.] In his *Topographical History of Staffordshire* [Appendix], pp. 141-145. Newcastle-under-Lyme, dy. 8vo, 1817. (Not important.)

GARNER, ROBERT—[The Mammals of Staffordshire.] In his *Natural History of the County of Stafford*, pp. 242-254. London, dy. 8vo, 1844. (A good list; enumerates 28 wild species; see also Supplement issued in 1860, pp. 33-34.)

BROWN, EDWIN.—[Mammals of the Burton-on-Trent District.] In Sir Oswald Mosley's *Natural History of Tutbury*, pp. 86-91. London, roy. 8vo, 1863. (A very good list; enumerates 29 wild, living species.)

MOSLEY, Sir OSWALD, Bart.—Mammals [of the Tutbury District.] In his *Natural History of Tutbury*, pp. 16-32. London, roy. 8vo, 1863. (A good and full list.)

SUFFOLK.

GURNEY, J. H.—Stray Notes on Norfolk and Suffolk Mammalia. *Trans. Norf. & Norw. Nat. Soc.*, vol. i, pp. 22-26. Norwich, dy. 8vo, 1870. (Refers to 18 species.)

HELE, N. F.—[Mammals of the District around Aldeburgh.] In his *Notes or Jottings about Aldeburgh*, pp. 180-182. London, cr. 8vo, 1870. (Mentions a few species only.)

ZINCKE, Rev. F. BARHAM.—[Notes on the Mammals of Wherstead.] In his *Materials for the History of Wherstead*. Ipswich, 8vo, 1887. (Reprinted from the *Suffolk Chronicle*, May 31st, 1884.)

SUSSEX.

CHAMBERS, GEO. F.—[The Mammals of the Eastbourne District.] In his *Handbook for Visitors to Eastbourne*, pp. 83-84. London & Eastbourne, cr. 8vo, 1868. (Enumerates 20 species.)

EASTBOURNE NATURAL HISTORY SOCIETY, MEMBERS OF.—[The Mammals of the Eastbourne District.] In their *Lists of the Local Fauna and Flora*, p. 2. [Eastbourne], cr. 8vo, 1873. (A list merely, without comments; enumerates 21 species; an earlier edition, dated 1871, not seen.)

WEAVER, J.—[Mammals of Harting.] In the Rev. H. D. Gordon's *History of Harting*, pp. 233-252. London, cr. 8vo, 1877. (A good and full list.)

WALES, NORTH.

EYTON, T. C.—[The Mammals] of Shropshire and North Wales. In *Mag. of Zool. & Bot.*, vol. ii, pp. 537-542. Edinb., Lond., & Dub., dy. 8vo, 1838. (A very good list; enumerates 26 species; additions, vol. iv, p. 396.)

WALES, SOUTH.

DILLWYN, L. W.—[Mammals of Swansea, &c.] In his *Materials for a Fauna and Flora of Swansea and the Neighbourhood*, pp. 1-2. Swansea, 8vo, 1848. (Enumerates 14 species.)

WARWICKSHIRE.

WAIT, Rev. W. O.—[List of the Mammals of the Rugby District.] In his *Rugby Past and Present*. Rugby, 1893. (Not seen.)

WESTMORELAND.

GOUGH, THOMAS. — Mammals [of the Kendal District.] In Cornelius Nicholson's *Annals of Kendal*, 2nd ed., pp. 306-307. London & Kendal, dy. 8vo, 1861. (Enumerates 21 species; the 1st ed. did not contain the list.)

MACPHERSON, Rev. H. A.—[The Mammals of Westmoreland.] In his *Vertebrate Fauna of Lakeland*, pp. 1-86. Edinburgh dy. 8vo, 1892. (A most admirable list; enumerates 42 living species.)

WIGHT, ISLE OF.

WARNER, Rev. RICHARD.—[The Mammals of the Isle of Wight.] In his *History of the Isle of Wight*, pp. 204-206. Southampton & London, dy. 8vo, 1795. (Enumerates a few species only.)

BURY, Rev. C. A.—Notes on the Mammalia of the Isle of Wight. *Zoologist*, vol. ii, pp. 776-790. London, dy. 8vo, 1844. (A good list.)

MARTIN (G. A.)—[Mammals of the Undercliff.] In his *Undercliff of the Isle of Wight*, pp. 162-176. London, post 8vo, 1849. (A fair list.)

MORE, A. G.—[The Mammals of the Isle of Wight.] In the Rev. C. Venables' *Guide to the Isle of Wight*, pp. 408-412. London, fcap. 8vo, 1860. (A good list.)

WILTSHIRE.

MATON, GEO., M.D.—Mammalia [of the Salisbury District.] In his *Natural History of a Part of the County of Wilts*, p. 70. London, dy. 8vo, 1843. (Very incomplete; enumerates 6 species only.)

AUBBEY, JOHN.—[The Mammals of Wiltshire.] In his *Natural History of Wiltshire; written between* 1656 *and* 1691; *edited by John Britton*, pp. 58-61. London, dy. 4to, 1847. (Interesting, but does not mention many species.)

WORCESTERSHIRE.

HASTINGS, CHAS., M.D.—[The Mammals of Worcestershire.] In his *Illustrations of the Natural History of Worcestershire*' pp. 56-62. London & Worcester, dy. 8vo, 1834.

YORKSHIRE.

GRAVES, Rev. JOHN.—[The Mammals of Cleveland.] In his *History of Cleveland*, App. xi, [3 pp.]. Carlisle, dy. 4to, 1808. (Enumerates 25 wild species, but without comments.)

DENNY, HENRY.—Sketch of the [Mammals] of Leeds and its Vicinity. *Annals of Nat. Hist.*, vol. v, pp. 382-386. London, dy. 8vo. (A good list.)

HOBKIRK, CHAS. P.—[The Mammals of the Huddersfield District.] In his *Huddersfield; its History and Natural History*. London & Huddersfield, cr. 8vo, 1859. (A fair list; enumerates 22 species; also in the 2nd edition, pp. 213-214, Huddersfield and London, cr. 8vo, 1868.)

ROBERTS (GEO.)—Topography and Natural History of Lofthouse and its Neighbourhood [&c.], 2 vols. London & Leeds, cr. 8vo, 1882-85. (Contains many notices of mammals.)

CLARKE, W. EAGLE & W. DENISON ROEBUCK.—[The Mammals of Washburndale.] *Naturalist*, vol. ix, pp. 11-12. Huddersfield, dy. 8vo, 1884. (Enumerates 10 species.)

ROEBUCK, WM. D.—[The Mammals of Yorkshire.] In Clarke & Roebuck's *Handbook of the Vertebrate Fauna of Yorkshire*, pp. vii-viii, xxx-xxxii, & 1-14. London & Leeds, dy. 8vo, 1881. (An excellent list; enumerates 46 species; additions in the *Naturalist*, vol. ix, 1884, pp. 147-150, raise the total to 45 species.)

CLARKE, W. EAGLE, W. D. ROEBUCK, & WM. STOREY.—[The Mammals of Upper Nidderdale.] *The Naturalist*, vol. xi, pp. 193-197. Huddersfield, dy. 8vo, 1886. (Enumerates 30 species.)

LOFTHOUSE, R.—[The Mammals of the Tees Valley.] *The Naturalist*, vol. xii, pp. 4-9. London, dy. 8vo, 1887.

WOODD, C. H. B.—[The Mammals of Langstrothdale.] *The Naturalist*, vol. xvi, pp. 135-136. London, dy. 8vo, 1891.

WAITE, EDGAR R.—[The Mammals of the Western Ainsty.] *The Naturalist*, vol. xvi, pp. 82-86. London, dy. 8vo, 1891. (A good list; enumerates 26 species.)

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

Aristotle on Plagues of Field Mice. — Possibly some readers of 'The Zoologist' may not have compared the accounts recently published of plagues of Field Voles in Scotland and Thessaly, with Aristotle's description of similar occurrences more than two thousand years ago. The comparison is most interesting, and the conclusion which Aristotle came to was very much the same as that expressed by the Committee appointed by the Board of Agriculture whose Report was published in the last number of 'The Zoologist' (p. 121). The following extract is taken from the translation of Aristotle's 'Natural History of Animals,' Bohn's edition (p. 178):—"There is a doubt respecting the reproduction and destruction of the Mice which live on the ground; for such an inexpressible number of Field Mice have sometimes made their appearance that very little food remained. Their power of destruction, also, is so great that some small farmers, having on one day observed that their corn was ready for harvest, when they went the following day to cut their corn, found it all eaten. The manner of their disappearance also is unaccountable; for in a few days they all vanish, although beforehand they could not be exterminated by smoking and digging them out, nor by hunting them and turning swine among them to root up their runs. Foxes also hunt them out, and wild Weasels are very ready to destroy them; but they cannot prevail over their numbers and the rapidity of their increase; nor indeed can anything prevail over them but rain, and when this comes they disappear very soon." —A. Holte Macpherson.

[This passage will be found in the 'Historia Animalium,' lib. vi., cap. 37, and it would be easy to supply references to other classical authors who have made allusion to the damage caused by Field Mice (Arouraioi). For example, Diodorus, lib. iii., cap. 30; Ælian, 'De Natura Animalium,' lib. ix., cap. 41, and lib. xvii., cap. 41; Rutilius, Itin. v. 285; Æschylus at Sisyphus; 'Geoponicorum sive de re rustica,' lib. xiii., cap. 5; not forgetting Theophrastus, and the more familiar Pliny. Ælian relates how a visitation and plague of Field Mice drove certain peoples in Italy out from their native land, and made them wanderers on the face of the earth; destroying not only the leaves of the plants as a drought would, or extreme frost, or other inclemency of the season, but eating up the very roots. Rutilius also relates (*l. c.*) how a similar experience befel the people of Cosa. Then there is the account given by Herodotus (Euterpe. ii. 141) of the defeat of the army of Sennacherib, in consequence of the destruction by Field Mice, during the night, of their quivers, arrows, and bowstrings, which were rendered useless by gnawing. In fact, the classics are full of

wonderful stories of Mice; and if anyone had leisure to collect and compare them, they would afford material for an extremely interesting article. We commend this to the consideration of the Rev. W. Houghton, whose interesting little book on the 'Natural History of the Ancients' (post 8vo, London, Cassell & Co., 1879) lies before us as we write, and who, with the knowledge of a naturalist, combines a familiar acquaintance with Greek and Latin authors. Apropos of this subject, we may direct attention to a brief article entitled "Field Voles and the Apolline Worship," by the Rev. W. Warde Fowler, of Oxford, published in the 'Classical Review' for November, 1892, and to a longer one with the title "Apollo the Mouse God," in the 'Stonyhurst Magazine' (December, 1892), which emanates from the well-known college in Lancashire, the article in question being attributed by report to the pen of a young but promising student of zoology, Mr. C. D. Plater. That there is a good deal of misconception and some exaggeration in the accounts of Voles given by the ancients is of course admitted, but that a good deal of ignorance still prevails on the subject is evident from what is stated in a long article headed "The Plague of Voles," in a London newspaper, published as recently as the 15th of April last. The writer of this article informs his readers that Voles, "though small, are really more of a cross between Squirrels and Beavers" (!); that "their molars, if they have flat tops, have transverse sides"; that "they run up trees, squirrel-like, and nibble at the tender bark up high"; that "they are partially dormant in winter," and "lay up stores which contain bits of carrots and potatoes, and among these often cherry-stones." This is a curious jumble of the habits of the Squirrel, Dormouse, Long-tailed Field Mouse, and Short-tailed Vole, which, it need hardly be said, is not to be found in the lately-issued Report of the Committee on Field Voles which the writer pretends to review.—Ed.]

CETACEA.

Hump-backed Whale on the Coast of Sligo.—On March 21st a specimen of the Hump-backed Whale, *Megaptera longimana* (Rudolphi), so rare in the British Seas, came ashore on the Enniscrone sands, Co. Sligo. The animal had probably been feeding too close to shore in the shallow water, and on grounding was overpowered by the surf and cast upon the sands. It lived for some hours, and at times lashed the water furiously with its tail and spouted from its blow-holes, occasionally opening and shutting its mouth. The body was very clumsy, and so thick as to look quite out of proportion to its length, being probably between twenty and thirty feet in circumference; black in colour all over the upper parts (the under parts, being buried in the sand, could not be seen), except the long narrow flippers, which were white, with a few black spots on upper side, and a few patches of white on the margin and under side of flukes, and

also on the longitudinal folds or pleats of skin on sides of throat, giving the latter a marbled appearance. To the edges and under sides of both flippers and flukes were attached a large number of the parasitic *Coronula diadermia*, like a gigantic *Balanus*, and so firmly fastened or embedded in the skin that both that and the blubber had to be cut before the shells could be detached. The long, narrow, straight flippers, with scarcely a perceptible curve, were notched or scalloped along the edges, as was also the posterior margin of the flukes. The head was broad and flat; the upper jaw very flat and depressed between the lower jaw-bones, which rose above it at each side where the mouth was close. On the upper jaw were three rows of tubercles; one of seven in the centre running from the end of the snout to the blow-holes, 6 to 7½ inches asunder in the row, and varying from a half to an inch in height; and one of eleven on each side just above the lips, almost reaching to the eyes, but in two places for about six or eight inches the side rows of tubercles were double. The baleen, as well as I could judge without measuring, appeared to be from twelve to fifteen inches in length, black in colour, and fringed at the ends with coarse greyish brown hairs. The small dorsal fin, placed very far back, was between six and seven inches in height. The dimensions, carefully taken with a string, were as follows:—Length from fork of tail to dorsal fin, 10 ft. 3 in.; dorsal fin to end of snout, 18 ft. 10 in.; total length, following curve of back, 29 ft. 1 in.; from end of snout to blow-holes, 4 ft. 7 in.; breadth of flukes, 9 ft.; flippers from humerus, 9 ft. 2 in. This whale has never before been recorded as a visitor to the coast of Ireland, and is evidently very rare in the British Seas. Prof. Flower, in his recent book on Mammals, mentions one taken at Newcastle in September, 1829, another in the estuary of the Dee in 1863, and a third at the mouth of the Tay in 1883–4; thus only three examples have been previously recorded to have visited the British Islands. It may not be out of place here to express my obligations to Mr. Alfred Heneage Cocks for his able paper on the "Finwhale Fishery on the coast of Finmark" (Zool. 1884), and to acknowledge that it was owing to my having read his very interesting notes that I was enabled to recognise this whale when it came ashore.—Robert Warren (Moyview, Ballina).

BIRDS.

Blackbird marked like Ring Ouzel.—About a year ago I reported to you a variety of Blackbird I used to see every day here during the nesting and breeding time—a well-plumaged male with a grey-drab crescent-shaped patch at the upper part of the breast near the throat. This bird is still here; I see it frequently on the lawn. It is now of a still more jet-black plumage, and the grey patch is very well defined and distinct. This is evidently not a case of a pied Blackbird, such as we often get in very severe winters (cases of this kind, I believe, never continue

the pied plumage after the summer moult), but a bird in which the abnormal marking is perpetuated, for I feel convinced it is the same bird that I saw a year ago. I imagine the reason I have not observed it in the meantime is because it is now, in the pairing and nesting time, that these birds are so constantly on the lawn, whereas through the autumn and early winter they are seldom there.—O. P. CAMBRIDGE (Bloxworth Rectory, Wareham).

Hybrid Birds at the Crystal Palace Show.—Under this heading (p. 154) Mr. A. Holte Macpherson, referring to the supposed Chaffinch-Canary mule at the recent Palace Show, says:—"I am not aware of any authenticated instance of such a hybrid." This is, I believe, true; but I cannot help thinking that the fact is largely due to misconceptions on the part of mule-breeders, many of whom are not scientific men, and firmly believe in two widely-disseminated fallacies:—(1) that the Chaffinch does not, like other finches, feed either its hen or its young from the crop; (2) that the Chaffinch pairs on the wing. I have heard both these reasons assigned for not attempting hybridization, not once, but repeatedly. As regards the first—that the Chaffinch does not feed from the crop—I may quote from notes which I took eight years ago:—"In the spring of 1886 I noticed that one of my hen Canaries had taken a fancy to a cock Chaffinch in my aviary, but for some time he seemed not to reciprocate the feeling; eventually, however, he began to feed her from the crop; therefore I placed the pair together in a large cage, where they paired; the Canary built and commenced to lay eggs marked and coloured like those of a Chaffinch. As the cock bird devoured the first egg, I took him out of the cage, and three eggs of the Chaffinch type were then laid and sat upon steadily for three weeks, when I took them out and found that they were all clear." Now this bird only paired once with the Canary, and apparently with little effect, for although the eggs had the opaque colouring and heavy marking of Chaffinch eggs they were not fertile. The feeding of the cock bird was, however, continued on the nest at intervals throughout the day until the evening of the day on which the first egg was destroyed, when (as soon as it was dark) I quietly removed the Chaffinch. I tried the same Chaffinch with a Canary last year, but he is now too old for breeding purposes. As regards the second fallacy, I have seen Chaffinches pairing on the road, in a country lane, as long ago as 1872.—A. G. BUTLER (Beckenham).

Hybrid Grey Geese.—The winter has passed without adding any fresh species to our Lakeland fauna, or favouring us with rarer visitors than a few Waxwings, Whoopers, and Bewick's Swans. One bird, however, has been obtained, which will be of permanent interest—a wild-bred hybrid between the Bean Goose and Grey Lag. This was shot a few weeks ago by my friend Mr. Thomas Mann, under the impression that it was a

Grey Lag; but the admixture of the characters of both species is well marked and interesting. The bill of this specimen most nearly resembles that of the Grey Lag, though there is a little black on the unguis and at the base of the bill. The feet, on the other hand, resemble those of the Bean Goose, but the two outer claws of both feet are white. The bird has recalled to mind an interesting hybrid which Mr. Blaaw presented to the Zoological Gardens a year or so ago. That bird had a Grey Lag's bill, but the feet closely resembled those of *Anser brachyrynchus* in coloration.—H. A. Macpherson (Carlisle).

Nesting of the Coot.—In his 'Manual of British Birds,' Mr. Howard Saunders states that young Coots are hatched "towards the end of May," and other authorities fix this as the approximate date; but I have never known this species remarked upon as being a regular early breeder. Mr. J. H. Salter, in 'The Field' of April 25th, 1891, reported his having seen a brood of Coots on April 10th on the river Cam, and from this he inferred that the first egg was laid on March 12th. This he evidently regarded as exceptionally early; but in Hampshire we can regularly count on finding Coots' eggs before the end of March. On March 24th, 1890, I found three nests containing eight, seven, and six eggs respectively; the first clutch was considerably incubated. On March 31st, 1891, I found a nest with nine eggs, incubated. On April 1st, 1892, Coots were unusually behindhand with us, but I found a nest with two eggs on that date. This year, on March 21st, two eggs had been laid. So although none of these dates are so early as that mentioned in 'The Field,' it will be seen that the Coot is, here at all events, an early breeder. On April 29th, 1891, I saw a brood of Coots about three weeks old; the keeper informed me that there was another brood about, of the same age.—Sutton A. Davies (Winchester).

[We can confirm these remarks from personal observation. In West Sussex, where for many years we had good opportunities of studying the habits of waterfowl on two large pools, surrounded by game coverts and strictly preserved, Coots, Moorhens, Water Rails, Grebes, Ducks, Teal, Snipe, and Peewits used to nest regularly. The Coots were paired in March, and had young hatched by the end of April. We have seen broods on April 29th. The earliest date noted for Coots' eggs was April 5th, on which day we also found eggs of the Teal, Snipe, and Peewit.—Ed.]

The Nutcracker in Lincolnshire.—With reference to Mr. Fieldsend's note (p. 153) on this bird in Lincolnshire, I may add that a Nutcracker, now in Mr. G. H. Caton Haigh's collection at Grainsby Hall, was obtained on Nov. 6th, 1888, in the parish of Marsh Chapel, near the Lincolnshire coast. This was just previous to the "great flight" of Woodcocks which came with a N.E. wind. It was recorded at the time by Mr. Haigh (Zool.

1889, p. 153), and also by myself in 'The Naturalist' for the same year (p. 44). Mr. Fieldsend's bird, therefore,—killed near Sleaford in March, 1833,—is not the only example recorded for this county.—JOHN CORDEAUX (Eaton Hall, Retford).

Stock Dove in Co. Wicklow.—While fishing in Wicklow, on April 2nd, I observed among some rocks about six miles south of Powerscourt Waterfall, a pair of Stock Doves, *Columba œnas*. On April 9th I again observed them amongst the same rocks, and conclude they will nest there if undisturbed. This shows an extension of its breeding range in Ireland. It has been known to nest near Powerscourt Waterfall within the last few years.—EDWARD C. BARRINGTON (15, Earlsford Terrace, Dublin).

Purple Gallinules in Norfolk and Sussex.—You ask (p. 105) for further information as to the two Purple Gallinules lately shot in Norfolk and Sussex. I have seen the one shot at Stoke Ferry, near Downham Market, and it is the grey-headed species of India, *Porphyrio poliocephalus*, Latham. Mr. J. Sandeman, of Westbrook, in answer to enquiry, tells me that the Sussex bird is also the Indian species. Probably they had escaped, but the Norfolk one shows no signs of confinement, excepting that it has lost half its tail. Its feet are smooth and clean beneath, and the nails perfect. The other was killed on a lawn by Mr. Sandeman's gardener, which is certainly suggestive of a prisoner escaped! I learn from Lord Lilford that he has kept many examples of *P. poliocephalus*, but has never lost one.—J. H. GURNEY (Keswick Hall, Norwich).

[The birds which escaped from Lord Lilford's aviaries were *Porphyrio smaragdonotus*, as mentioned in our last number (p. 147). But several of the Grey-headed species (*P. poliocephalus*) have been kept in a state of semi-domestication by Mr. Meade Waldo in Kent, and by Mr. Meinherzhagen in Hants, and the one killed in Sussex may have been one of these. We have no faith in the so-called "British-killed Purple Gallinules," and believe that everyone of these birds which has been shot or caught in a state of liberty must at some time or another have previously made its escape from a state of semi-domestication amongst ornamental waterfowl. The argument that such birds show no traces of confinement is of no value whatever, for under the conditions in which ornamental waterfowl are usually kept there is no more wear and tear than with truly wild birds.—ED.]

Ring Ouzel in Winter.—On Feb. 25th two adult males, showing an unusual amount of white on the wing, were seen by Mr. Hewetson, of Leeds, and myself near the coast-guard houses at Kilnsea, in Holderness. These, or others, had been observed early in the month, and no doubt came across at the same time and in company with the great flight of old Fieldfares and cock Blackbirds on or about the 4th of this month. I am informed that Ring Ouzels had arrived on the moors in the West Riding of Yorkshire

as early as March 18th this year, a very early date.—John Cordeaux (Eaton Hall, Retford).

Garganey near Hastings.—An adult male Garganey, or Summer Teal, *Querquedula circia*, was shot in the early part of this year in the Pett Level, near Hastings. Mr. William Borrer, in his 'Birds of Sussex' (pp. 438–9), mentions a few examples of this handsome little duck as having been captured in this county, the last recorded specimen having been an immature male, which was shot near Lewes on March 25th, 1870.—Thomas Parkin (Fairseat, High Wickham, Hastings).

SCIENTIFIC SOCIETIES.

Linnean Society of London.

April 6, 1893.—Prof. Stewart, President, in the chair.

Messrs. F. H. Baker and R. S. Standen were elected Fellows.

The President took occasion to refer to the great loss which botanical science had sustained by the death, on April 4th, of Professor Alphonse de Candolle, of Geneva, an announcement which was received with profound regret. Prof. de Candolle was the senior Foreign Member of this Society, having been elected in May, 1850, and was the recipient of the Society's Gold Medal in 1889.

Mr. Clement Reid exhibited and made some remarks upon the fruit of a South-European Maple, *Acer monspessulanum*, from an interglacial deposit on the Hampshire coast.

Mr. R. Lloyd Praeger, who was present as a visitor, exhibited some rare British plants from the Co. Armagh, and gave an account of their local distribution.

A paper was then read by Mr. W. B. Hemsley, on a collection of plants from the region of Lhassa, made by Surgeon Capt. Thorold in 1891, and a further collection from the Kuenlun plains, made by Capt. Picot in 1892. Some of the more interesting plants were exhibited, and critical remarks were offered by Messrs. C. B. Clarke, J. G. Baker, and Dr. Stapf.

Dr. H. C. Sorby gave a demonstration with the oxyhydrogen lantern, and exhibited a number of slides which he had prepared of small marine organisms, many of them extremely beautiful, mounted transparently so as to show the internal structure.

April 20.—Prof. Stewart, President, in the chair.

The Rev. A. B. Morris was admitted, and Mr. A. Trevor Battye was elected a Fellow of the Society.

In view of the approaching Anniversary Meeting, the election of Auditors took place, when Dr. Meiklejohn and Mr. E. A. Batters were nominated on behalf of the Council, and Messrs. Thos. Christy and W. F. Kirby on behalf of the Fellows.

The President took occasion to notice the retirement of Mr. F. H. Kingston after thirty-six years service as Lodge-keeper, and presented him with a testimonial in the shape of a cigar-case containing five-and-thirty pounds in bank-notes which had been subscribed on his behalf by all the Societies in Burlington House. After a suitable response on the part of the recipient, and *àpropos* of the long residence referred to, attention was directed to some photographs of Burlington House, with the gateway as it existed before the rebuilding in 1868, and showing the old colonade, which had since been demolished, and was lying still uncared for in Battersea Park.

On behalf of Mr. C. Chilton, of Dunedin, N. Z., Mr. W. Percy Sladen gave an abstract of a paper on the subterranean Crustacea of New Zealand, with remarks on the fauna of caves and wells. The paper contained a *resumé* of previous publications on the subject, with additional information from the author's own observation, and an expression of his views on certain controversial points in connection therewith. His remarks were criticised by the President and by Prof. Howes, Dr. Henry Power, and Mr. G. Fookes.

A paper was then read by Mr. H. M. Bernard on the anatomy, physiology, and histology of the *Chernetidæ*, with special reference to the rudimentary stigmata, and to a new form of trachea, on which an interesting discussion ensued, and Mr. Bernard replied to the criticisms which were offered. The meeting adjourned to May 4th.

Zoological Society of London.

March 28, 1893. — Sir W. H. Flower, K.C.B., LL.D., F.R.S., President, in the chair.

A report was read, drawn up by Mr. A. Thomson, the Society's Head-Keeper, on the insects bred in the Insect House during the past season.

A communication was read from Mr. Herbert Druce, giving an account of some new species of Lepidoptera Heterocera, chiefly from Central and South America.

Mr. F. E. Beddard read a paper on the brain of the African Elephant. The author gave reasons for disagreeing with some of the conclusions of Dr. Krueg, but confirmed others. The outline is more like that of the Carnivorous than the Ungulate brain, but the principal furrows appear to be arranged on a plan characteristic of the Elephantidæ.

Mr. W. T. Blanford showed that the various names hitherto employed in systematic works for the bird called by Jerdon the Himalayan Cuckoo

(*Cuculus himalayanus*, *C. striatus*, and *C. intermedius*) belonged to other species. He also gave reasons for not adopting S. Müller's *C. canoroides*, and accepted the term *C. saturatus*, Hodgson, as the correct scientific name.

A communication was read from Mr. F. M. Woodward entitled "Further Observations on the Genitalia of British Earthworms." This paper chiefly dealt with supplementary gonads which were found to be much more common than had been supposed; in one specimen an hermaphrodite gland was discovered in addition to testes and ovaries.

April 18.—Sir W. H. Flower, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March; and called special attention to three White-tailed Gnus, *Connochætes gnu*, from the Transvaal (a male and two females), obtained by purchase March 7th; and to three Springboks, *Gazella euchore*, from South Africa, deposited by H.R.H. the Prince of Wales.

Mr. Sclater exhibited and made remarks on a specimen of a curious variety of the Pig-tailed Monkey, *Macacus nemestrinus*, from the Baram River, lately living in the Society's Menagerie.

A communication was read from General Sir Lothian Nicholson, K.C.B., R.E., Governor of Gibraltar, respecting the Barbary Apes, *Macacus inuus*, living on the Rock of Gibraltar, which were stated to have increased of late years, and were now supposed to be nearly sixty in number.

Mr. W. L. Sclater made some remarks on the principal animals noted in the Zoological Gardens of Antwerp and Amsterdam, which he had lately visited.

A communication was read from Mr. A. E. Shipley, containing an account of the anatomy and histology of two Gephyrean worms of the genus *Sipunculus* from Zanzibar, together with a few observations on Sipunculids in general.

Mr. Oldfield Thomas gave an account of a small collection of Mammals obtained in Central Peru by Mr. J. Kalinowski. Amongst several species represented in this collection, either new or of such interest as to deserve a record, was especially noted a new form of Rodents of the family *Muridæ*, proposed to be called *Ichthyomys stolzmanni*.

Mr. H. J. Elwes read a communication from Mr. W. Warren describing a large number of new species and new genera of Moths of the family *Geometridæ*, from Sikkim and other districts of India, with notes on the localities and on other points.—P. L. Sclater, *Secretary*.

Entomological Society of London.

April 12, 1893.—Frederic Merrifield, Esq., Vice-President, in the chair.

Sir John Talbot Dillwyn Llewelyn, Bart., exhibited a number of specimens of Lepidoptera, Coleoptera, and Hymenoptera, all caught in Glamorganshire. The Lepidoptera included two remarkable varieties of *Vanessa io*, both obtained from the same brood of larvæ, from which the usual eye-like spots in the hind wings were absent; varieties of *Arctia menthastri;* a long series of melanic and other forms of *Boarmia repandata* and *Tephrosia crepuscularia;* and bleached forms of *Geometra papilionaria*. The Coleoptera included specimens of *Prionus coriarius*, *Pyrochroa coccinea*, *Otiorhynchus sulcatus*, and *Astynomus ædilis*, which latter Sir John Llewelyn stated had been handed to him by colliers, who obtained them from the wooden props used in the coal mines, made out of timber imported from the Baltic. Mr. Merrifield, Dr. Sharp, Mr. Bower, and Mr. Stevens made some remarks on the specimens.

Sir John T. D. Llewelyn enquired whether the name of the moth which had a sufficiently long proboscis to fertilize the large Madagascan species of Orchis, *Angræcum sesquipedale*, was known. Mr. C. O. Waterhouse stated that the collections received at the British Museum from Madagascar had been examined with the view to the discovery of the species, but up to the present it had not been identified.

Mr. H. Goss exhibited, for Mr. Frank W. P. Dennis, of Bahia, Brazil, several nests of Trap-door Spiders containing living specimens of the spider, and read a communication from Mr. Dennis on the subject. Several photographs of the nests and the spiders were also exhibited. It was stated that Mr. Dennis had found these nests at Bahia in one spot only in a cocoa-nut grove close by the sea.

Mr. McLachlan read a paper entitled "On species of Chrysopa observed in the Eastern Pyrenees; together with descriptions of, and notes on, new or little-known Palæarctic forms of the genus." The author stated that the species referred to in this paper had been observed by him in the Eastern Pyrenees, in July, 1886, when staying with M. René Oberthür. After alluding to the nature of the district, and its capabilities from an entomological point of view, the paper concluded with descriptions of certain new palæarctic species of the genus. Dr. Sharp, who said that he was acquainted with the district, and Mr. Merrifield made some remarks on the paper.—H. Goss, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

A Descriptive List of the Deer Parks and Paddocks of England. By JOSEPH WHITAKER. 8vo, pp. 204, with Illustrations. London: Ballantyne, Hanson & Co. 1892.

MANY people, doubtless, will regret that Mr. Whitaker has not attempted to bring out a new edition of Shirley's 'English Deer Parks,' which has long been out of print, and which, dealing with the history of the parks as well as with their contents, has a much wider scope than his own recent publication. To have corrected Shirley's mistakes (some of them important) and to have supplied additions, would have been an excellent undertaking, although it would have necessarily entailed a considerable expenditure of time and research. If, on comparison of the two books, that of Mr. Whitaker appears somewhat meagre in regard to the information given about each park, it has this merit, from the statistical point of view, that the list of English parks is more complete, and the acreage more exact.

Occasionally Mr. Whitaker is to be caught tripping, as on page 3 of his "Introduction," where a list of fifty parks is given, prefaced by the remark that "the under-mentioned parks described in Shirley's 'English Deer Parks, 1867,' no longer contain deer." But of these at least a dozen are not included by Shirley as existing parks, and seven others, though noticed by him as existing, had no deer in them at the date of his publication.

Again, while deducting these on the one hand, we might on the other hand add eight or nine names to the list of parks which no longer contain deer. This page of the book therefore requires considerable revision, but it is almost the only one on which any corrections of importance are needed.

On page 6, Mr. Whitaker observes, "Outside the park fences Fallow-deer have for centuries been found in an almost wild state in the New Forest and Epping Forest, and there is still a remnant of an ancient herd in Rockingham Forest, although their numbers are now reduced to about a dozen." To this paragraph might be joined that on p. 72, where it is stated that in the large tracts of open woodland around Haye Park, Here-

fordshire, which is very hilly and picturesque, lying close under Vinnall Hill, wild Fallow-deer, said to have escaped originally from the park, are to be found; nine were shot in one day during the winter of 1891–92. To this it might be added that others are to be seen in the woodlands lying to the S.W. of Ludlow, and in St. George's Hills, near Weybridge, the descendants, doubtless, of of some that had escaped from park palings.

At p. 12, Mr. Whitaker remarks that Warnham Court, in Sussex, produces the largest deer in England, adding that a stag has been killed there exceeding 44 stone (of 8 lbs. to the stone), and with thirty-six points. It would have been well to explain that this abnormal growth of horn is to be accounted for by the dressing of bone manure which is spread over half the pasture in the park every year. As regards variation in colour, noticed on p. 15, attention is directed to a white or cream-coloured variety of the Red-deer with flesh-coloured noses and pale blue or straw-coloured eyes, to be found in some half-dozen parks, as at Windsor, Langley, Welbeck, Woburn, Alnwick, and Ashridge. In Badminton Park some of the Red-deer have white faces, and present that curiously unprepossessing appearance which is more familiar in the country inn sign of "The Bald-faced Stag."

It is curious to notice the difference in the weight of deer in different parks, according to the richness or otherwise of the pasture, and probably to the quantity and quality of the winter feeding. The average weight of a Fallow buck in good condition may be put down at 100 lbs., and a doe at 60 lbs., but these weights are in many parks exceeded by 20 lbs. where the conditions under which they are kept are especially favourable. In Biddlesden Park, Buckinghamshire, belonging to Colonel G. M. Morgan, a buck was killed a few years ago of the phenomenal weight of 157 lbs. clean. But there must be surely some mistake in the statement that in Crofton Park, Cumberland, the *average* weight of bucks is 195 lbs. and of does 175 lbs. We incline to think this must be a printer's error for 95 lbs. and 75 lbs. respectively.

As to the feeding and general management of deer, the Introduction contains a good deal of practical information, and may be consulted with advantage by all who have reason to suppose that the condition of their herds is capable of improvement.

There are some nice full-page illustrations, amongst which may be specially noticed "The Buck Gates in Thoresby Park, Notts," and "The Great Oak in Spetchley Park, Worcestershire," while as vignettes to some of the chapters we have examples of different styles of deer-fence as adopted in different parks. This must always be a matter of taste, but in our opinion nothing looks better, or harmonises more with the landscape, than the old-fashioned oak-paling, covered with lichens and mellowed with age. Mr. Whitaker is quite right in his assertion that for sylvan beauty and variety of timber, few landscapes can compare with an English deer-park.

Horn Measurements and Weights of the Great Game of the World; being a Record for the use of Sportsmen and Naturalists. By Rowland Ward. 4to, pp. 264, with Illustrations. London: published by the Author. 1892.

It has become very much the fashion of late years to organise parties for big-game shooting in Africa, and although one cannot but deplore the wholesale and unnecessary destruction of many fine desert forms which are sacrificed to the greed of unreasonable sportsmen, we must, on the other hand, admit that many new species would probably not have been made known but for their acquisition by adventurous Englishmen.

Hence, when we read of the arduous journeys that have been undertaken, and the hardships that have been undergone, and the risks to human life that have been incurred in the pursuit of big-game, we cannot but excuse the pride with which a successful hunter exhibits some splendid head and horns, or other trophy which has been secured by his own prowess. This fashion in sport has naturally created a spirit of rivalry, and it is now-a-days the ambition of every hunter of big-game to eclipse his brother sportsmen in the size, weight, and horn-measurements of the trophies he brings home. Under these circumstances it is perhaps not surprising that, owing to the want of proper standards of comparison, much difference of opinion should prevail about "record" heads. What has long been wanting is a handbook to the big-game not only of Africa, but of other continents, giving precise and authoritative information

about every known species, together with the measurements ascertained upon a definite plan, and figures of typical specimens upon a sufficiently large scale for comparison.

The volume published recently by Mr. Rowland Ward, will to a certain extent supply this want, though it must be regarded rather in the light of a first attempt, to be improved in successive editions until a greater completeness is attained. It will be found useful for the large number of measurements, which are given in tabular form, of the horns of deer, antelopes, wild goats, wild sheep, and oxen, with the addition of the lengths of rhinoceros' horns, elephants' tusks, and the measurements of lions and tigers. From these figures a sportsman may calculate the average dimensions of a given species, and ascertain whether his own trophies are above or below the standard.

It is to be regretted that the treatment of the different species in this book is so unequal. Some of them, like Clarke's gazelle, Beatrix antelope, and Alaskan wild sheep, have a page or two of description accorded to them; the majority have only a table of measurements. In some cases the dimensions are given of twenty or thirty specimens, in others only two or three are noted; in several the habit given is erroneous or misleading, and in hardly one case do we find a reference to the first published description of a species, or indeed to any description whereby the reader may be guided to its identification. The inclusion of such references would have been extremely useful.

The illustrations, unfortunately, are very unequal. Some of them, such as the Reindeer, Moose, Hartebeeste, and Oryx, are good enough for the purpose, but a great many are drawn on too small a scale to be of any use. The heads of American big-game figured are quite inadequate; the Black-tailed Deer, the Prong-horn, and the Big-horn Sheep convey no idea of the wild beauty of the originals; and yet it would not have been difficult to photograph more typical examples, and reproduce by process blocks at a comparatively trifling cost. It is to be hoped that in a subsequent edition these blemishes may be removed, and the utility of the volume will be much enhanced.